IEEE 488

IEC 625

PM2534

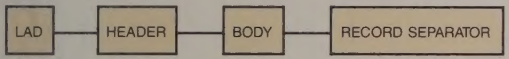
SYSTEM MULTIMETER

4822 872 30314 880301

1. PROGRAMMING

1.1 Interface programming

Coding syntax



Note: When programming the interface, before every header-body combination, the listen address must be sent.

FUNCTION	ISO 7-BIT CODE	DESCRIPTION
SERVICE REQUEST	MSR␣n[n][n]	Setting of the service request mask. n[n][n] is the decimal equivalent of the mask bit pattern.
SEPERATORS input/output	SPR␣nn[,nn]	Setting of the separators. nn is the decimal equivalent of a character of the ISO code table. (decimal equivalent 27 (ESC) is not allowed).
IDENTITY	ID␣?	On receipt of this command the identity is output (PM2534x Syy).
INTERFACE TEST	TSI␣U TSI␣<dec.170>	On receipt of these commands a self test is performed. (U=with service request) (<dec.170> means without service). 170 is the decimal value and can be programmed on most controllers with CHR$(170).

Note: [ ] means optional
␣ = space

PHILIPS

PHILIPS

PROGRAMMING cont.

Service request mask

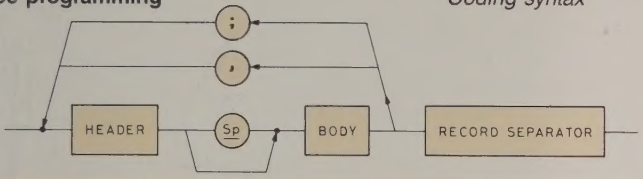
BIT	8	7	6	5	4	3	2	1	0
DECIMAL VALUE	256	128	64	32	16	8	4	2	1

BIT	DESCRIPTION	REASONS FOR SERVICE REQUEST
8	Instrument no longer busy	The PM2534 has made a measurement and has sent it via the interface. It can now be triggered.
7	System 21 event	A service request can be generated by the System 21 part.
6	Incorrect measurement	The PM2534 has made an incorrect measurement (e.g. overload, crest-factor exceeded, failure in a calibration measurement or a faulty Null measurement).
5	Internal failure	The PM2534 has an internal failure (e.g. No CAL).
4	Program failure	An illegal body or header in a command is received.
3	Not used	
2	Not used	
1	Hold mode	The hold mode is selected via the data hold probe. Also when the hold mode is released it can generate a service request.
0	Data available	Valid data is available in the output buffer.

Specific System 21 commands	
AID_E	Output from System 21 enabled
AID_D	Output from System 21 disabled

1.2 Device programming

Coding syntax

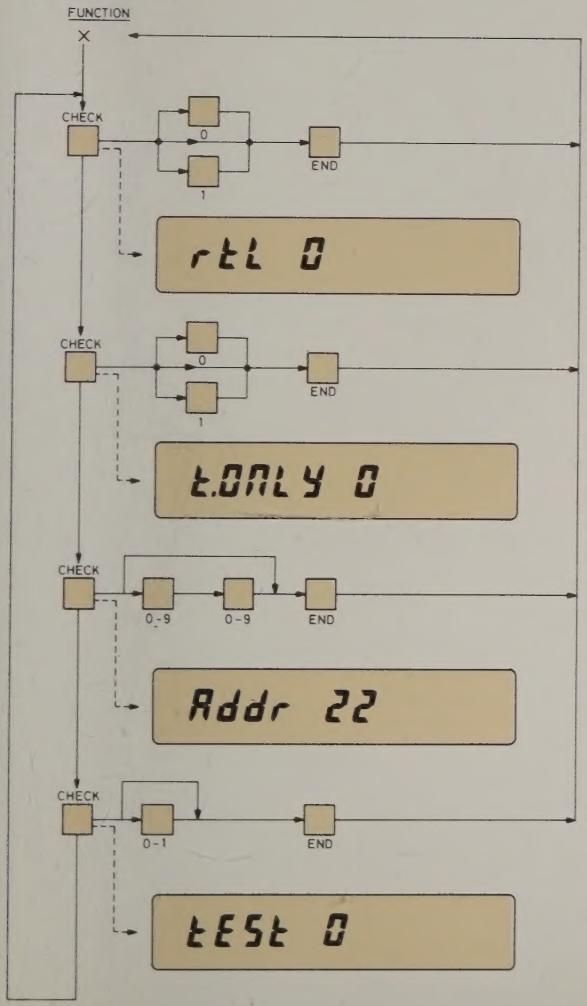


Commands	Description
Function	
[FNC_] xxx	xxx can be one of the following functions: V D C = Direct voltage I D C = Direct current V A C = Alternating voltage I A C = Alternating current R T W = Ohm 2-wire T D C = Temperature °C R F W = Ohm 4-wire
Ranging	
RNG_A[uto] RNG ±aaaE±aa	Auto-ranging The expected measuring value or the end-of-range can be programmed as range in scientific or technical notation. (e.g. RNG 3 or RNG 3E+03).
Speed/Resolution	
MSP_x	x = integer between 1 (slow) and 4 (fast) to program the speed
RSL_x	x = integer between 4 (low) and 7 (high) to program the resolution.
Filter	
FIL_ON FIL_OFF	Filter is switched ON/OFF.
Internal settling time	
IST_ON IST_OFF	Internal settling time switched ON/OFF.

Delay	
DLY__ON DLY__OFF	The programmed delay is switched ON/OFF.
DLY x[xxxxxx]	The value x[xxxxxx] is stored as the delay value. Combination of these commands is possible (e.g. DLY__ON, 234).
Trigger mode	
TRG__I	Internal triggering.
TRG__B	Single triggering via IEEE/IEC bus.
TRG__E	Single triggering via IEEE/IEC bus or "EXT TRIGGER" input.
TRG__K	Triggering via the keyboard (Single triggering), via the "EXT TRIGGER" input or via the IEC/IEEE bus.
Start	
X__[1]	Starts a measurement.
Display	
DSP__ON DSP__OFF	The display is switched ON/OFF.
TXT__x[xxxxxx]	Text specified in xxxxxxx is displayed
Output mode	
OUT__S	The whole measuring data string is output.
OUT__N	Only numeric results are output.
OUT__N,x	A numeric result is output with a length specified in x.
Null mode	
NUL__ON NUL__OFF	The Null function is switched ON/OFF.
NUL__N[EW]	A new Null value is stored in memory.
Cal mode	
CAL__ON CAL__OFF	The cal mode is switched ON/OFF
Diagnostic mode	
TST	The Diagnostic mode switched on.

Note: [ ] means optional,__means a space

2. SETTINGS



ST4757
850902

3.2 Output of settings

COMMAND	DESCRIPTION	OUTPUT POSSIBILITIES
FNC_?	FUNCTION	FNC_V D C FNC_I D C FNC_V A C FNC_I A C FNC_R T W FNC_T D C FNC_R F W
RNG_?	RANGE	RNG_ _ _ _ _ _ A U T O x = numbers between 0-9 RNG_xxx. E ± 0 x or Sp)
MSP_?	SPEED	MSP_1 MSP_3 MSP_2 MSP_4
RSL_?	RESOLUTION	RSL_4 RSL_6 RSL_5 RSL_7
FIL_?	FILTER MODE	FIL_O F F FIL_ _O N
IST_?	INTERNAL SETTLING TIME	IST_O F F IST_ _O N
TRG_?	TRIGGER MODE	TRG_I TRG_B TRG_E TRG_K
DLY_?	DELAY	DLY_O F F, xxxxxxx (x = numbers between 0 and 9) DLY_ _O N,xxxxxxx
DSP_?	DISPLAY STATE	DSP_O F F DSP_ _O N
OUT_?	OUTPUT MODE	OUT_S OUT_N OUT_N,x (x = numbers between 1 and 9)
NUL_?	NULL MODE	NUL_O F F NUL_ _O N
CAL_?	CAL MODE	CAL_ _O F F CAL_ _O N

3.4 Device status data

bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
EX	RQS	AB	BSY	EF3	EF2	EF1	EF0

BSY = 0 PM 2534 is not measuring and the data of any previous measurements has been output.
BSY = 1 The PM2534 is measuring and/or data has not been output.

If AB=0 then the bits EF3 to EF0 indicate a normal condition.

AB	BSY	EF3	EF2	EF1	EF0	Description
0	0	x	x	x	0	No measurement is started and there is no data available.
0	1	x	x	x	0	A measurement is started but no data available.
0	1	x	x	x	1	Data is available, not yet sent via the interface.
0	0	x	x	x	1	Data is sent via the interface but remains available. Instrument can be triggered.
0	x	x	x	1	x	The HOLD mode is selected via the data hold probe.

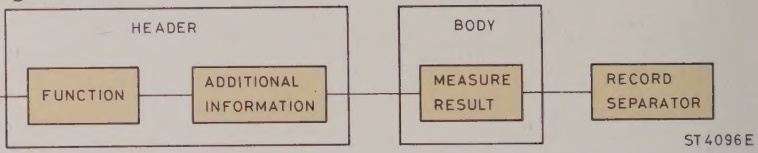
If AB=1 then the bits EF3-EF0 indicate the abnormal condition.

AB	BSY	EF3	EF2	EF1	EF0	Description
1	x	x	x	x	1	Program failure (e.g. an illegal body has been received).
1	x	x	x	1	x	Internal failure (e.g. No Cal condition).
1	x	x	1	x	x	Incorrect measurement (OL, CF, failure in a calibration measurement or a faulty NULL measurement).
1	x	1	x	x	x	System 21 event.

3. OUTPUT DATA

3.1 Measuring data

Format



Char.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Data	V	D	C	Sp	Sp	C	+	1	2	3	.	4	5	6	7	E	–	0	3	SR3
	R	T	W	Sp	Sp	Sp	+	1	2	.	3	4	5	6	7	E	+	0	3	SR3

FUNCTION

Function	Characters 1 2 3
V=	V D C
V~	V A C
Ω2w	R T W
Ω4w	R F W
A=	I D C
A~	I A C
°C	T D C

ADDITIONAL INFORMATION

The second part gives additional information

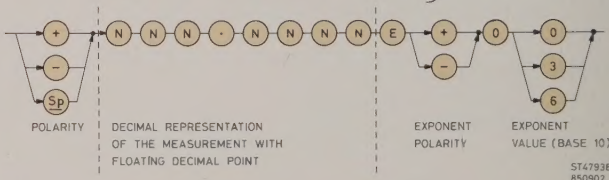
Sp Space (4th character)

C Calibration measurements } 5th character
Sp Space

O ADC overload
C Crestfactor, (V~, A~), clipping input circuit (other functions)
F Fail at calibration measurement
N Failure at NULL-meaurements
R Reduced accuracy due to an unstable input signal
Sp Space } 6th character

? Dummy measurement

MEASURE RESULT



3.3 Dump

After the dump command, the PM2534 sends all the settings to the controller.

Example: FNC VDC;RNG 300.E–03;MSP 2;RSL 5;FIL OFF;IST ON;TRG B;
DLY ON,0000150;DSP ON;OUT N,3;NUL OFF;CAL OFFLF